



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/978,174	10/17/2001	Mikihide Nakamaru	086531-0131	3949

22428 7590 01/23/2003

FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
----------	--------------

3641

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/978,174

Applicant(s)

NAKAMARU ET AL.

Examiner

Rick Palabrica

Art Unit

3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-16 is/are pending in the application.
- 4a) Of the above claim(s) 9 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-8, 10-13, 15, and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. Applicant's amendment in Paper No. 8, correcting the specification and drawings, canceling claim 1, adding claims 15 and 16, and amending claims 2-13, is acknowledged. The corrected drawings are acceptable.

Claim Rejections - 35 USC § 112

2. Claims 2-8, 10-13, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 15, the phrase "**so that** a cooling water therein flows and circulates in the inner structure of the reactor containment vessel", which is a description of preference, renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Terms such as "effectively", etc. are relative, they can be given no definite meaning and accordingly they render the claims vague and indefinite, and the metes and bounds thereof are undefined (e.g., see claim 16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3-7, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatamiya et al. (U.S. 5,211,906) in view of either one of Morishita et al. (JP 59-99393) or Forsberg (Nuclear Technology, Vol. 76, Jan. 1987), and further in view of Fortescue et al. (U.S. 3,475,272). Hatamiya et al. disclose the applicant's claims except for top-entry controls rods and control rod drives within the reactor shroud.

Hatamiya et al. disclose a boiling water reactor (e.g., see Figs. 5 and 14) comprising a reactor building 21, a reactor containment vessel 10, a pressure vessel 1, a drywell 12, a pressure suppression pool 11, a reactor containment vessel cooling system pool 62, a reactor core 2. Other reactor components, i.e., reactor core shroud, control rod guide tubes and control rod drive mechanisms are inherent to a boiling water reactor. Note that the reactor containment vessel cooling system pool 62 is disposed above the suppression pool. The reactor containment vessel is a double wall structure comprising an inner wall 14 and an outer wall 10, forming an inner hollow structure 15 over at least a portion of the reactor containment vessel (e.g. see also Fig. 6). The inner

Art Unit: 3641

hollow structure 14 is provided with a plurality of ribs 30 (see Fig. 6). Note also that the inner hollow structure is in fluidic communication with the reactor containment vessel cooling pool 62 during a loss of coolant accident (see column 30, lines 33+).

As to the limitation in claim 3, the claim language reads on Hatamiya et al.'s piping and nozzles connected to tank 20 and pipe 6 (e.g., see Fig. 14).

As to the limitation in claim 4, the claim language reads on the valves shown as part of pipe 5.

As to the limitation in claim 5, note in Fig. 6 that the plates of the inner and outer containment vessels (14 and 10, respectively) are mutually opposing in a separated fashion through the ribs 30.

As to the limitation in claim 6, note the plurality of emergency opening passages between the suppression pool and drywall at different elevations (see Fig. 14, numerals 60 and 61, and pipe at the lower part of the suppression pool)

As to the limitation in claim 7, note that Fig. 14 shows the presence of water in the inner hollow structure 14 of the containment vessel. This water is supplied from a not-shown storage tank (see column 25, lines 63+). Note this water is normally present and available for cooling said inner structure.

Morishita et al. disclose in Figs. 1-6 a boiling water reactor with control rods (113) that are inserted from the top of a nuclear pressure vessel (101). They teach that this configuration is more reliable than bottom-entry control rods that need to be inserted against gravity (see pages 3 and 4 of the English language translation).

Forsberg discloses in Fig. 1 the use of top-entry control rods for BWRs with

passive emergency cooling systems (PECOS). He discloses that this configuration avoids bottom penetrations in the reactor vessel and therefore eliminates the possibility of pipe breaks and subsequent loss of ECCS water (e.g., see page 185, last paragraph).

Either one of Morishita et al. or Forsberg disclose the control rod drive mechanism as being outside the reactor pressure vessel.

Fortescue et al. disclose a reactor (see Fig. 1) wherein the control rod drive mechanism (82) is contained within the pressure vessel. They teach that this arrangement allows easy replacement of the control rod drive mechanism with the reactor in the loading condition (see column 8 lines 56+).

One having ordinary skill in the art would have recognized that having top-entry control rods are advantageous over bottom-entry control rods. He would have also recognized that placing the control rod guide mechanism within the reactor pressure vessel is a well-known alternative to locating it outside the pressure vessel.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Hatamiya et al., by the teachings of either one of the Morishita et al. - Fortescue et al. combination or Forsberg - Fortescue et al. combination, in order to have a boiling water reactor nuclear plant comprising: a reactor building; pressure containment vessel positioned in said building; drywell comprising a space inside said pressure containment vessel; pressure suppression pool provided inside said pressure containment vessel; reactor core having fuel assemblies supported by a reactor core support plate and an upper grid plate provided in an inner base portion of said nuclear reactor pressure vessel; reactor core

Art Unit: 3641

shroud surrounding said reactor core and said upper grid plate; control rods inserted in said control rod guide tubes; and control rod drive mechanisms which drive the insertion and withdrawal of said control rods from above said reactor core, the control rod drive mechanisms being provided above said control rod guide tubes and inside said reactor core shroud, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the substitution of one method of placement of the control rod drive mechanism by another well-known method of placement of this mechanism.

As to the limitation in claim 15 of the inner and outer walls of the containment vessel being made of multiple plates, this makes the claim a product-by-process claim.

MPEP 2113 states in this regard:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966.

The claims are replete with statements that are essentially method limitations or statements of intended or desired use, e.g., "for inserting and withdrawing the control rods from an upper portion of the reactor core", "so that cooling water therein flows and circulates ...", "to effectively cool a portion of the inside of the reactor containment vessel", "which can be opened to an exterior of the said reactor core shroud", etc. (e.g., see claims 15, 16 and 4). These statements, as well as other statements of intended use do not serve to patently distinguish the claimed structure over that of the reference. See *In re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*,

Art Unit: 3641

168 USPQ 530; In re Casey, 152USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does."
Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525,1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

In any case the apparatus based on the combination cited above is capable of operating in the same manner and for the same intended use as claimed in the invention.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatamiya et al. in view of either one of the combination of Morishita et al- Fortescue et al. or Forsberg Fortescue et al., as applied to claims 3-7, 15 and 16 above, and further in view of Tominaga et al. (U.S. 5,087,408). Either one of the Hatamiya et al.- Morishita et al- Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al. combination disclose the applicant's claim except for gravity-based piping connection between the suppression pool and the reactor pressure vessel.

Tominaga et al. teach (e.g. see Fig. 5 or Fig. 15) a boiling water reactor with a passive containment system comprising a reactor core with fuel assemblies and shroud, reactor pressure vessel, control rods and control rod drives, reactor building and a pressure containment vessel. They disclose a drywell (4) and pressure suppression pool (6) within the pressure containment vessel (1), wherein said pressure suppression pool is connected to said nuclear reactor vessel by means of a gravity-based piping through which water drops by gravity (e.g. see Fig. 15 and column 22, lines 5+).

One having ordinary skill in the art would have recognized that all references are in the same field of endeavor of maintaining the integrity of boiling water reactor core and containment, and the teachings of Tominaga et al. would apply to either one of the cited combinations.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by either one of the Hatamiya et al.- Morishita et al- Fortescue et al. combination or the Hatamiya et al.- Forsberg-Fortescue et al. combination, by the teaching of Tominaga et al. in order to have a boiling water reactor nuclear plant with a pressure suppression pool connected to nuclear reactor vessel by means of a gravity-based piping through which water drops by gravity, as this is no more than the use of well-known design/techniques in the nuclear art.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatamiya et al. in view of either one of the combination of Morishita et al- Fortescue et al. or

Art Unit: 3641

Forsberg Fortescue et al., as applied to claims 3-7, 15 and 16 above, and further in view of Kamogawa (JP 2-115793). Either one of the Hatamiya et al.- Morishita et al.- Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al. combination disclose the applicant's claim except for a normally-closed water discharge pipe from the pressure suppression pool to the drywell..

Kamogawa discloses a reactor containment system having emergency reactor cooling water (see Figs. 1-10). He shows in Fig. 5 a vacuum rupture valve (37) connecting the suppression chamber and the drywell.

One having ordinary skill in the art would have recognized that all references are in the same field of endeavor of maintaining the integrity of boiling water reactor core and containment, and the teachings of Kamogawa would apply to either one of the cited combinations.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by either one of the Hatamiya et al.- Morishita et al- Fortescue et al. combination or the Hatamiya et al.- Forsberg-Fortescue et al. combination, by the teaching of Kamogawa in order to have a boiling water reactor nuclear plant with a normally-closed water discharge pipe from the pressure suppression pool to the dry well, as this is no more than the use of well-known design/techniques in the nuclear art.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatamiya et al. in view of either one of the combination of Morishita et al- Fortescue et

Art Unit: 3641

al. or Forsberg Fortescue et al., as applied to claims 3-7, 15 and 16 above, and further in view of Jeter (U.S. 4,644,780). Either one of the Hatamiya et al.- Morishita et al.- Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al. combination disclose the applicant's claim except for the use of guard pipes.

Jeter teaches that the Nuclear Regulatory Commission (NRC) has decreed that rupture conditions must be postulated on safety grade piping components and structural means must be provided to protect them from these conditions. He teaches the use of a guard pipe as a self-supporting pipe rupture and whip restraint system (see Abstract).

One having ordinary skill in the art would have recognized that the pipes and valves in a containment system, including the pressure vessel, suppression pool and drywell are safety grade piping.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Hatamiya et al.- Morishita et al.- Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al., by the teaching of Jeter, in order to have a guard pipe extending from the dry well to the suppression pool, said pipe accommodating the valves and piping from the pressure vessel, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Hatamiya et al. in view of either one of the combination of Morishita et al.- Fortescue et al. or Forsberg Fortescue et al., as applied to claims 3-7, 15 and 16 above,

Art Unit: 3641

and further in view of Bunge et al. (DE-2144445). Either one of the Hatamiya et al.-Morishita et al.-Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al. combination disclose the applicant's claim except for having the turbine installed in the reactor building.

Bunge et al. teach a reactor and turbine plant enclosed by the main reactor building. One having ordinary skill in the art would have recognized the arrangement of Bunge as an alternative way of configuring the reactor and turbine of a nuclear power plant by co-locating them in the same building.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Hatamiya et al.-Morishita et al.-Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al., by the teaching of Bunge et al., in order to have a turbine system installed on an upper portion of the reactor building, because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the substitution of one way of configuring the reactor-turbine combination with another well-known configuration.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Hatamiya et al. in view of either one of the combination of Morishita et al.-Fortescue et al. or Forsberg Fortescue et al., as applied to claims 3-7, 15 and 16 above, and further in view of either one of Takahiro (JP 2000-346993) or Masataka (JP11-311693). Either one of the Hatamiya et al.-Morishita et al.-Fortescue et al. combination

or the Hatamiya et al.-Forsberg-Fortescue et al. combination disclose the applicant's claim except for a pressure vessel extraction space in the reactor building.

Either one of Takahiro or Masataka discloses a method of extracting a reactor pressure vessel from the reactor building by providing an aperture in the roof of said building. Masataka teaches that exchanging the pressure vessel has the advantage of prolonging the life of a nuclear power plant.

One having ordinary skill in the art would have recognized that the method of either one of Takahiro or Masataka would be applicable and advantageous to a boiling water reactor, such as the power reactor of either combination cited above.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Hatamiya et al.-Morishita et al- Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al., by the teaching of either one of Takahiro or Masataka, to provide an extraction space in the reactor building for lifting the reactor pressure vessel, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one Hatamiya et al. in view of either one of the combination of Morishita et al- Fortescue et al. or Forsberg Fortescue et al., as applied to claims 3-7, 15 and 16 above, and further in view of, and further in view of Solorzano et al. (U.S.5,610,962). Either one of the Hatamiya et al.- Morishita et al- Fortescue et al. combination or the Hatamiya et al.-

Art Unit: 3641

Forsberg-Fortescue et al. combination disclose the applicant's claim except for the anti-seismic foundation base for the reactor building.

Solorzano et al. disclose a nuclear power plant construction method wherein the major structures including the reactor building are located on a common mat foundation that houses seismic isolators (see Abstract).

One having ordinary skill in the art would have recognized that Solorzano et al.'s method would be applicable to a boiling water reactor and that it has the advantage of providing protection of safety systems against seismic events.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Hatamiya et al.-Morishita et al- Fortescue et al. combination or the Hatamiya et al.-Forsberg-Fortescue et al. combination, by the teaching of Solorzano et al. to have the reactor building positioned on a foundation base having an anti-seismic structure, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

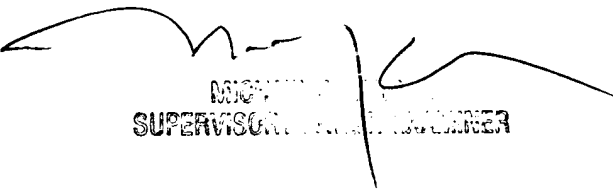
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Art Unit: 3641

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP
January 21, 2003


MICHAEL J. HARRIS
SUPERVISOR